SUMMARY PAGE

Southeast Area Monitoring and Assessment Program
Bottom Mapping Workgroup Overview
by
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Chairman

In 1985, the Southeast Area Monitoring and Assessment Program (SEAMAP-South Atlantic) established a Bottom Mapping Work Group to develop a regional database that describes the location and characteristics of hard-bottom habitat on the continental shelf off the southeastern United States (NC-FL). These diverse areas represent essential fish habitat for a wide variety of species that are commercially and recreationally harvested in the South Atlantic region. In order for state and federal resource agencies to better maintain these fisheries, there is a need to identify the location and extent of reef habitat, determine the carrying capacity of these habitats, and obtain more information on the ecological relationships of the resources supported by hard-bottom reef habitat. This knowledge will also assist resource managers in evaluating the effects of past and future fishery regulations and anthropogenic stresses on these valuable resource areas. Recent consideration of the establishment of marine fisheries reserves will also benefit from the knowledge of how reef and non-reef habitats are distributed in the region.

The primary objectives of the Work Group are to:

(1)   conduct an extensive search of existing databases to identify all known reef habitats on the continental shelf off the southeastern U.S. coast from the North Carolina/Virginia border to the Florida Keys and from the beach out to 200 m in depth; and

(2)   summarize the bottom type information into flexible, easy to use databases which will provide managers and researchers with pertinent information concerning the location and extent of these areas, types of data used in determining bottom type, and data sources.

Intensive efforts to compile and analyze existing data sources began in 1992 after efforts were completed to (1) identify agency needs, (2) finalize the format and structure of the bottom mapping database, and (3) standardize the approach for evaluating each type of data. Primary efforts have focussed on evaluating data available from state and federal agencies and other sources that have conducted scientific assessments of bottom resources in the region. Non-scientific sources, such as recreational diver records and commercial fishing maps, have not been

incorporated into the database to date. The data sources vary in information content and accuracy in the location of the reef habitat. Criteria for evaluating some data types (e.g. finfish collections) have varied slightly in each portion of the region due to latitudinal differences in the distribution and ecology of some species. Additionally, new types of data (e.g. sediment cores, aerial photography) have been incorporated into some of the more recent data sets evaluated.

The databases from all study phases completed to date have been compiled in a single database using a PC-compatible format (D-Base®) according to procedures developed by the Bottom Mapping Work Group. The database has also been incorporated into ArcView® files for analysis and viewing using Geographic Information Systems (GIS) and into Portable Document Format (PDF) files for use in viewing summary maps of the data with software provided on this CD product. This latter effort was completed by the Florida Marine Research Institute.

To date, 65,727 data records have been compiled from databases obtained off North Carolina, South Carolina/Georgia, and Florida in three major study phases. A brief summary of the records available off each of the states is provided in the following table.

Summary of Bottom Mapping Records By State and Bottom Type

State	N. Carolina	S. Carolina	Georgia	Florida	Totals
Bottom Type:					
Hard Bottom	2,006	4,414	1,206	14,058	21,684
Possible Hard Bottom	1,527	1,261	894	3,292	6,974
No Hard Bottom	9,224	5,700	1,664	19,648	36,236
Artificial Reef	113	147	119	312	691
Artificial Reef / Hard Bottom	0	12	0	2	14
Not Applicable	0	0	3	105	108
Total Number of Records	12,890	11,534	3,886	37,417	65,727

Information on the specific databases evaluated and the methods used for analyzing and tabulating the data were summarized in three final reports submitted to the SEAMAP-SA Committee. Each of these reports is reproduced in this CD.

Many individuals have contributed significantly to the bottom mapping effort. Current members of the Bottom Mapping Workgroup are:

Name	Affiliation	Representing
Fred Rohde	North Carolina Division of Marine Fisheries	North Carolina
Steve Ross	Center for Marine Science Research	North Carolina
Bob Van Dolah	South Carolina Marine Resources Division	South Carolina
Charles Barans	South Carolina Marine Resources Division	South Carolina
Jim Henry	Georgia Southern University	Georgia
Henry Norris	Florida Dept. of Environmental Protection	Florida
Bill Lyons	Florida Dept. of Environmental Protection	Florida
Roger Pugliese	South Atlantic Fishery Management Council	SAFMC
Richard Parker	National Marine Fisheries Service	NMFS
Ken Savastano	National Marine Fisheries Service	NMFS

Other individuals who have greatly assisted the workgroup in developing the database include: H. Ansley, T. Azarovitz, A. Bury, J. Boylan, D. Camp, M. Clise, M. Colby, R. Dentzman, E. Foell, R. Gilmore,Jr., C. Jackson, M. Leiby, D. Machowski, P. Maier, R. Matheson,Jr., M. Moser, R. Minkler, B. O'Gorman, T. Perkins, P. Phalen, J. Reed, F. Sargent, J. Scurry, G. Sedberry, S. Snyder, B. Welsh, and D. Wilder.

The Bottom Mapping Workgroup is continuing efforts to acquire and analyze new and existing data on bottom characteristics in the regions that could not be processed within the available budget and time constraints. Recommendations to the SEAMAP-SA Committee for mapping unexplored bottom areas, and expanding the database to deeper water habitats are also being considered.

LINKS

VIEW ORIGINAL SOUTH CAROLINA SEAMAP DOCUMENT

VIEW ORIGINAL NORTH CAROLINA SEAMAP DOCUMENT

VIEW ORIGINAL FLORIDA SEAMAP DOCUMENT

VIEW GENERAL NOTES ON THE DATA

VIEW DATA DICTIONARY

VIEW QUALITY CONTROL DOCUMENTATION

VIEW METADATA

VIEW NEW MAPS OF DATA

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Summary of the compiled SEAMAP data:
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Total number of records: 65,727

Number of records and bottom type by state location:

STATE	NO. RECS	HB	PH	NH	AR	HA	NA
NC	12,890	2,006	1,527	9,244	113	0	0
SC	11,534	4,414	1,261	5,700	147	12	0
GA	3,886	1,206	894	1,664	119	0	3
FL	37,417	14,058	3,292	19,648	312	2	105

HB = Hard Bottom, PH = Possible Hard Bottom, NH = No Hard Bottom,
AR = Artificial Reef, HA = Hard Bottom on Artificial Reef, NA = Not Applicable

Number of records and type of data collected by each state:

STATE	NO. RECS	POINTS	LINES	AREA
NC	11,743	1886	9,761	0
SC	17,169	11,423	5,762	0
GA	110	110	0	0
FL	36,705	18,632	1,255	16,818

GENERAL NOTES ON THE DATABASE:

New grid:
A new one-minute cell grid was generated for the entire compilaiton area.

Total number of cells = 51,957

The grid covering the study area extends from the Virginia-North Carolina border down the east coast to the southern tip of Florida and westward to the Dry Tortugas at the western most end of the Florida Keys. Oceanward, the grid extends approximately five nautical miles beyond the 200m isobath (the edge of the continental shelf).

Additional data (new agency codes and state source):
CEXX: from FL
FL12: from FL
GNR1: from GA
AS01...WH03 (35 new agencies): from SC

SEE DATA DICTIONARY for a complete list.

New areas added to project:
Polygon data with agency codes of FL12 and CEXX represent new areas added to the study area. The new region extends from the St. Lucie Inlet (southern terminous of the original Florida document area) southward, along the Florida Keys, and westward to the Dry Tortugas. See maps for clarification.

Notes on area data:
-Some adjoining polygons of the same bottom type may be treated as separate records based on other criteria. For example, two juxtaposed hardbottom polygons may have different relief codes and are therefore represented in the data base as two records.

-Polygon data were intersected with the one-minute grid. Where a polygon fell in more than one block, that polygon was divided in the database into separate records based on the number of blocks containing part of the polygon. For example, if a polygon fell within four block, it would appear in the database as four separate records.

Notes to Appdx 4 (area data):
-Of all the polygon data, there are two distinct data sets which overlap. Twenty three cells are affected by this overlap. Blocks which contain data from each dataset are repeated in Appendix 4 to preserve the information from each dataset. The two datasets in question are FL12 and CEXX.

There are 23 repeated block numbers representing the blocks where the two polygon data sets overlap. An additional field is included in Appendix 4 called 'Overlap'. This field will have a value of either 'CEXX', 'FL12', or blank to specify which data set applies where there's an overlap.

Note on Agency WH01:
-All three orginal docs (NC,SC,FL) had a 'WH01' agency and all three were different. Adjustments were necessary and the codes are as follows:

WH01 - original NC WH01
WH02 - new SC data
WH03 - new SC data
WH04 - FL data originally WH01
WH05 - SC data originally WH01

Notes on database parameters:
-New POSMET (positioning methods):
10 = Baseline data created by photogrammetry (for Agency FL12)

-New CORFAC (correction factor):
6 = Stereoscopic interpretation and zoom transfer scope (for Agency FL12)

-New GEAR (gear types):
AF02 = 1:48,000 Registered color air photo (for FL12)
GR01 = Vibracore
GR02 = Smith-Mcintyre grab
GR03 = associated with WH01/1666
GR04 = Campbell Grab
GR05 = Peterson Grab

SEE DATA DICTIONARY for a complete explanation.

Notes on data processing:
-Data falling outside grid:
25 points and 203 lines fall outside the grid.
Data falling outside the grid are assigned a BLOCK = 99999999.
Therefore, data outside the grid do not contribute to grid coding of observation counts. They are included in the primary database only.

-108 records have a btm_typ = 'NA'. See page 21 of the **Florida document**. These 108 records were originally coded as blank.

NEW POSMET LIST:

    0 = Unknown
    1 = LORAN-C
    2 = LORAN-A
    3 = GPS
    4 = Range & Bearing
    5 = Dead Reckoning
    6 = Decca Hi-Fix System
    7 = MiniRanger Positioning System (tm)
    8 = Triangulation from Shore
    9 = Stereoscopical Interpolation onto USGS Quads
   10 = Baseline data created by photogrammetry (for FL12)

NEW CORFAC LIST:

    0 = Unknown
    1 = None
    2 = AFS
    3 = Corrected to a benchmark or known landmark
    4 = LORAN-C numbers converted by LORAT program
    5 = LORAN-C time delays converted by NorthStar(tm) version 96 interpolation program
        (NC data) or Differentially corrected (FL data)
    6 = Stereoscopic interpretation and zoom transfer scope

NEW GEAR TYPE LIST:

```
Aerial Photography (AF)
     AF01 = 1:7200 Registered Color Aerial Photography
     AF02 = 1:48,000 Registered Color Aerial Photography
Benthic Grab (BG, SP)
     BG01 = Shipek Grab
     BG02 = Smith McIntyre Grab
     SP01 = 1 3/8" split-spoon boring
Dredge (DR)
     DR01 = 8-ft by 3-ft Scallop Tumbler
     DR02 = 3-ft Box
     DR04 = 4-ft Nantucket Hydraulic Clam
     DR05 = Pipe
     DR06 = Scallop
     DR07 = Clam
     DR08 = Tumbler
     DR09 = Kirtley Dredge
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          DR10 = Canvas Dredge
      Trawl (BT, FT, ST and TT)
          BT05 = Blake; 5-ft
          BT10 = 10' beam trawl
          FT01 = 3/4 scale Yankee Trawl,#36 body-L liner-A cod-E*
          FT02 = 40/54 Fly Net (070 MRRI)
          FT03 = Semi-balloon 40/60 4-seam trawl*
          FT04 = Fish; Falcon (233 MRRI)
          FT05 = 1986 Seamap Data (230 MRRI)
          FT06 = Fish; Standard Mongoose
          FT07 = Fish
          FT10 = 17' Try Net w/ 3/4 mesh throughout (NCDMF)
          FT11 = #36 Yankee Otter Trawl, roller rigged
          FT17 = #36 Yankee Otter Trawl, w/ disc sweeps
          FT31 = Carolina Wing Trawl (NCDMF)
          FT34 = Irish 3-Bridle Trawl (NCDMF)
          FT40 = Fish, 40-ft; Balloon Trawl
          FT41 = modified 2-seam #41 Yankee Trawl, roller-
                 rigged (NMFS-Woods Hole)
          FT49 = Fish; 50-ft
          FT50 = 2-seam roller-rigged Fish Trawl, 50'
          FT51 = #36 or #41 Yankee Trawl, roller-rigged
          FT52 = # 36 or # 41 Yankee Trawl, w/disc sweeps
          FT54 = 2-seam roller-rigged Fish Trawl, 54'
          FT55 = Flat Trawl, 93' headrope (NCDMF)
          FT60 = 2-seam roller-rigged Fish Trawl, 60'
          FT70 = 2-seam roller-rigged Fish Trawl, 70'
          FT80 = 2-seam roller-rigged Fish Trawl, 80'
          FT86 = 2-seam roller-rigged Fish Trawl, 86'
          FT99 = 24.6-30 m USSR Trawl w/ 20 m ground cables
          FT56 = Fish; 55-ft Semi-balloon Otter
          ST05 = Shrimp; Otter, 5-ft Headrope
          ST09 = Shrimp
          ST10 = Shrimp; Otter, 10-ft Headrope
          ST12 = Shrimp; Otter, 12-ft Headrope
          ST16 = Shrimp; Otter, 16-ft Headrope
          ST20 = Shrimp; Otter, 20-ft Headrope
          ST21 = Shrimp; Otter, 21-ft Headrope, 1-in stretch mesh
          ST22 = Shrimp; Otter, 22-ft Headrope, 2-in stretch mesh
          ST40 = Flat Shrimp Trawl, 40' headrope (NMFS-Pasc)
          ST41 = 2-seam Trawl, 41' headrope (NMFS-Pasc)
          ST42 = Shrimp Trawl, 42' headrope (NMFS-Pasc)
          ST50 = Shrimp Trawl, 50' headrope (NMFS-Pasc)
          ST60 = Shrimp Trawl, 60' headrope (NMFS-Pasc)
          ST64 = Shrimp Trawl, 64' headrope (NCDMF)
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                ST65 = Shrimp Trawl, 65' headrope (NMFS-Pasc)
                ST80 = Shrimp Trawl, 80' headrope (NMFS-Pasc)
                ST86 = Shrimp Trawl, 86' headrope (NMFS-Pasc)
                TR02 = Mini Antillean S-trap baited (041 MRRI)
                TR03 = Fine-Mesh Trap*
                TR04 = Florida "Antillean" Trap (074 MRRI)
                TR05 = Chevron Trap
                TR10 = modified Arrowhead Trap, baited (NMFS-Pasc)
        Vibracore Sampler (VB)
                VB01 = 4-in inner diameter core sampler
                VB02 = 2-in inner diameter core sampler
                VB03 = 3.5-in inner diameter core sampler
        SCUBA (SD)
                SD01 = Dive from Vessel or Small Boat (Pop Dive)
        Submersible (SD, SL, Jn)
                SD02 = Johnson Sealink, Lockout Dive
                SL01 = Johnson Sealink, Undetermined
                J101 = Johnson Sealinh I, Photography
                J102 = Johnson Sealink I, Photography & Transcript
                J103 = Johnson Sealink I, Manipulator Arm
                J104 = Johnson Sealink I, Lockout Dive
                J201 = Johnson Sealink II, Photography
                J202 = Johnson Sealink II, Photography & Transcript
        Recording Fathometer (FA)
                FA01 = Raytheon DE Recording Fathometer or
                       Hydroproducts Gifft Series 4000 Precision Depth
                       Recorder
        Side-scan Sonar (SS)
                SS03 = Klein K-Map4 system
                SS04 = Klein Series 595
                SS12 = EG & G model 259-3
                SS21 = Dowty model 3010?
        Subbottom Profiler (PR)
                PR01 = 3.5-kHz subbottom profiler:O.R.E.*
                PR02 = UNIBOOM (tm) subbottom profiler
                PR03 = Sparker
        Closed Circuit TV (CC)
                CC01 = Black & White*
                CC02 = Color
        Underwater Camera (UC)
                UC01 = multi-shot underwater drop camera
    Combination Gears
        Side-scan Sonar and Closed-circuit TV
                0101 = Klein 595 and Color TV
                0102 = EDO Western model 606 and Color TV
                0151 = EG&G Model 259-3 and B&W TV*
```

```
Side-scan Sonar and Subbottom Profiler
     0201 = EG&G Model 259-3 and Uniboom Subbottom
              Profiler:O.R.E*
     0202 = EG&G model 259-3 and Uniboom subbottom
     0204 = EDO sidescan and EDO 3.5 kHz subbottom profiler
     0205 = EG&G Model 259-3 and EDO 3.5 kHz Subbottom
              Profiler:EG&G Model 225*
Side-scan Sonar, Close-circuit TV and Subbottom Profiler
     0401 = EG&G Model 259-3, B&W TV and 3.5 kHz Subbottom
              Profiler*
     0403 = EG&G model 259-3, B&W TV & Uniboom subbottom
Subbottom Profiler and TV
     0801 = 3.5-kHz Subbottom Profiler: O.R.E and B&W TV*
Closed-circuit TV and Recording Fathometer
     1001 = Sled-mounted video camera and Raytheon DE-719
Closed-circuit on ROV and Recording Fathometer
     1101 = Video camera mounted on HBOI CORD and Raytheon
              DE 121 or Hydroproducts Gifft Series 4000
Side-scan Sonar and Recording Fathometer
     1201 = Klein Series 400 system and Raytheon DE 121 or
              Hydroproducts Gifft Series 4000
     1202 = Klein Series 595 and Innerspace Model 400
     1203 = Klein Model 590 Digtal Sonar System and Odum
              Echotrac DF 3200
```

QUALITY CONTROL

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Problems found in the compiled SEAMAP data. These
data were removed from the compiled database and can
be found in the individual state primary databases
(ncprime.dbf, scprime.dbf, flprime.dbf) by searching
for the specified Uniq_ids:

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Summary of problems:

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6   points fall on land
98 lines have a zero length
18 lines fall on land
6   lines are anomalously long
3   lines in protected water (outside grid)
There are some missing uniq_ids in the previously
  published data
There are 25 repeated records in the main data set

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6 points fall on land:

UNIQ_ID
7653
21182
22426
22532
22547
23478

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98 Zero-length lines with geartypes suited to line data:

AGENCY_PRO	ORIGCOLL	GEARTYPE	UNIQ_ID
dm72	331	FT10	20637
dm72	3573	FT52	20645
dm15	1978	ST64	18953
dm72	3612	FT52	20694
dm72	316	FT10	20704

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AGENCY_PRO	ORIGCOLL	GEARTYPE	UNIQ_ID
dm72	3560	FT52	20724
dm72	3764	FT52	20770
dm72	3902	FT52	20818
dm70	112	FT10	19267
dm15	3748	ST64	18985
dm72	3355	FT52	2084
dm70	1118	FT52	19276
dm70	1853	ST64	19296
dm70	1854	ST64	19308
dm70	1129	FT52	19320
dm70	1828	ST64	19322
dm65	1193	ST64	19173
dm70	1825	ST64	19381
dm70	1014	FT51	19387
dm65	433	FT51	19203
dm70	1009	FT51	19392
dm70	3860	FT31	19403
dm70	1070	FT51	19421
dm65	419	FT51	19212
dm70	1454	FT52	19459
dm70	477	FT52	19473
dm70	3542	FT31	19482
dm05	2640	FT52	18630
dm65	435	FT51	19221
dm70	3025	FT31	19485
dm65	440	FT51	19226
dm70	965	FT52	19530
dm70	1568	FT52	19564
dm70	1390	FT52	19586
dm70	991	FT51	19589
dm70	1589	FT52	19605
dm70	2960	FT31	19650
dm75	3990	FT52	20937
dm70	1457	FT52	19657
dm70	3802	FT31	19660
dm05	2596	FT52	18683
dm65	438	FT51	19239
dm70	1590	FT52	19679
dm70	1818	FT52	19701
dm70	983	FT51	19723
dm70	1666	FT34	19730
dm70	1592	FT52	19781
dm05	2902	FT31	18705
dm70	1525	FT52	19804

AGENCY_PRO	ORIGCOLL	GEARTYPE	UNIQ_ID
dm70	2408	FT31	19811
dm70	1570	FT52	19815
dm70	1999	FT52	19822
dm70	1633	FT52	19834
dm70	3055	FT31	19844
dm70	4032	FT31	19852
dm70	473	FT52	19863
dm70	1523	FT52	19884
dm70	2276	FT31	19887
dm70	2766	FT31	19898
dm05	2410	FT31	18746
dm72	823	FT51	20897
dm70	1027	FT51	19949
dm70	1026	FT51	19954
dm05	2370	FT31	18755
dm05	2370	FT31	18756
dm70	1668	FT34	19971
dm05	2643	FT52	18758
dm70	1031	FT51	19986
dm70	2202	FT52	19989
dm70	2217	FT52	19994
dm70	1584	FT52	20011
dm70	1639	FT52	20022
dm70	1587	FT52	20036
dm70	1670	FT34	20049
dm70	2223	FT31	20057
dm70	1644	FT52	20063
dm70	2224	FT31	20067
dm70	1938	FT34	20073
dm70	2226	FT31	20091
dm70	2254	FT31	20101
dm70	2006	FT52	20122
dm70	2675	FT31	20136
dm70	30	FT10	19932
dm70	486	FT52	20170
dm70	1650	FT52	20249
dm05	2501	FT31	18822
dm05	2405	FT31	18826
dm05	2404	FT31	18828
dm70	1492	FT52	20410
dm70	2187	FT52	20443
dm75	4396	FT52	21000
dm05	2451	FT31	18849
dm70	1426	FT52	20504

```
AGENCY_PRO        ORIGCOLL GEARTYPE  UNIQ_ID
   dm70               1432 FT52        20506
   dm05               2505 FT31        18857
   dm70               2820 FT31        20559
   dm70               2021 FT52        20576
   dm70               2206 FT52        20343
```

=====================================
18 lines fall on land:

```
UNIQ_ID
2271
2272
2253
11122
11123
17378
18581
18604
18605
18605
17238
19808
20375
20431
20462
20463
20512
20583
```

=====================================
6 lines are anomalously long:

```
UNIQ_ID
19625
20727
22970
23772
19240
23830
```

```
=====================================
```
3 lines are in protected waters (in bays or estuaries)

```
UNIQ_ID
19305
19596
20360
```

```
=====================================
```
There are 258 missing uniq_ids (gaps in the sequence) in the
  previously published data

```
      Missing numbers    STATE
      1122-1127            SC
      12140-12141          NC
      18270-18512          NC
      21608-21614          NC
```

```
=====================================
```
There are 50 (25 repeated records) duplicates in the database
```
 Duplicate uniq_ids:
       1172,1155
       1159,1175
      11780,11796 (these two have different depths)
      14325,14324
      14461,14460
      12282,12283
      18946,18945
      14908,14909
      18950,18949
      15184,15185
      16805,16802
      13995,13994
      15342,15341
      14063,14062
      15577,15576
      19901,19249 (these two have different depths)
      17821,17825
      17832,17834
      12804,12803
      18988,18989
```

```
18992,18993
19831,19832 (these two have different depths)
20951,20950
18756,18755
19995,20000 (these two have different depths)
```

The higher number uniq_id was removed from the database.
Where a pair had different ending depths, both were removed.

```
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```